

REMARKS/ARGUMENTS

This amendment is in response to the Office Action dated July 19, 2006. The deadline for responding to the office action has been extended to January 19, 2007 by way of a request for the 3 month extension of time made herewith.

I. Introduction and Formal Interview Request

Applicants' undersigned representative hereby formally requests an interview regarding this case. It is requested that upon receiving this amendment the Examiner call Applicants' undersigned representative at (732) 542-9070 to schedule the interview.

Claims 1-30 are pending. Claims 5, 18 and 19 have been amended as per the Examiner's suggestions to address and overcome the indefinites rejections raised in the Office Action. Applicants representative thanks the Examiner for the suggestions on how to clarify these claims. Claim 26 has also been amended to clarify the wording of the claim.

Claims 1-30 stand rejected under 35 U.S.C. §102 in view of U.S. Patent publication 2003/0053524 hereinafter the Dent reference.

Applicants believe that the reference used by the Examiner to reject the claims does not disclose anything

close to the claimed invention. It is hoped that a discussion of the invention and the applied reference during the interview will facilitate a prompt allowance of this case. This amendment will be used as the basis for the interview should the interview request be granted.

While there may be no need for an interview regarding the outstanding rejections if, after consideration of the remarks which follow, the Examiner decides to withdraw the rejections, Applicants representative would still be willing to discuss the case with the Examiner in an interview to facilitate a better understanding and appreciation of the invention.

The claim objections were addressed by the amendments made herein. Applicant will now address and overcome the rejections of claim 1-30 under 35 U.S.C. §102.

III. The 35 U.S.C. § 102 Rejections

1. Claims 1-16

A. The applied Reference Does Not Disclose the Claimed Subject Matter

Claim 1 is patentable because it recites:

A communications method for use in a communications system including a base station and a plurality of wireless terminals, a different communications channel existing between each wireless terminal in said plurality of wireless

terminals and said base station, the communications channel existing between each particular wireless terminal and the base station having a quality which is the channel quality for the particular wireless terminal, the method comprising:

operating the base station to:

- i) maintain a set of channel condition information indicating the channel quality of each of said plurality of wireless terminals;
- ii) examine the set of channel condition information to identify wireless terminals having channel conditions which differ from one another by at least a pre-selected minimum amount; and
- iii) assign a communications channel segment to be used to communicate superimposed signals corresponding to at least two different wireless terminals identified as having channel conditions which differ by at least said pre-selected minimum amount.

In rejecting claim 1 and 11 the Examiner states

Regarding claims 1, 11, Dent discloses a communications method (and a base station) for use in a communications system including a base station and a plurality of wireless terminals, a different communications channel existing between each wireless terminal in said plurality of wireless terminals and said base station, the communications channel existing between each particular wireless terminal and the base station having a quality which is the channel quality for the particular wireless terminal, the method comprising: operating the base station to: maintain a set of channel condition information indicating the channel quality of each of said plurality of wireless terminals (paragraphs 0006-0007, Figure 1, the system includes base stations to monitor the conditions of channels); examine the set of channel condition

information to identify wireless terminals having channel conditions which differ from one another by at least a pre-selected minimum amount (paragraphs 0006-0007, 0014-0017); and assign a communications channel segment to be used to communicate superimposed signals corresponding to at least two different wireless terminals identified as having channel conditions which differ by at least said pre-selected minimum amount (paragraphs 0014-0020, there exists a set of uplink propagation channels (signals) transmitted from the mobile stations to the base stations, which are, indeed, time aligned the base stations, and therefore, being separated at the receivers in the base stations, which separation (which separation between signals or channels, pertaining to the amount difference between the terminals, avoids any interference results). (bold added for emphasis)

Applicants have reviewed paragraphs 0006-0007 and 0014-0017 and have found nothing that teaches, discloses or suggest operating a base station to:

ii) examine the set of channel condition information to identify wireless terminals having channel conditions which differ from one another by at least a pre-selected minimum amount;

Given that the applied reference fails to disclose this step, the rejection of claim 1 as well as the rejection of claims 2-16 should be withdrawn.

B. Request for Clarification

Given that the Examiner has not matched individual elements or steps in the applied reference to the claims but has instead chosen to cite various paragraphs in support of the rejection, Applicants' representative requests that if the Examiner intends to maintain the rejection of any of claims 1-16, the Examiner be prepared to discuss in the interview where in the cited paragraphs: examining a set of channel conditions to identify wireless terminals having channel conditions which differ is described and what in the reference is the "pre-selected minimum amount" which the Examiner believes is disclosed in the reference.

For the Examiner's convenience, Applicants have set forth below the text of the Dent reference cited by the Examiner with regard to such features. It is requested that the Examiner precisely identify where "examining" is described in this material since Applicants have been unable to find any mention of it in the cited paragraphs. Such clarification is required so Applicants can have a full and fair opportunity to respond.

Paragraphs 0006-0007 and 0014-0017 of the Dent reference which are cited by the Examiner state:

[0006] The present invention provides a method and apparatus for reducing interference between signals transmitted from different mobile terminals in a CDMA mobile communication system. A plurality of mobile terminals transmit respective spread spectrum coded signals to one or more base stations in a mobile communication network. Rake receivers located within the base stations then despread the signals transmitted from the plurality of mobile terminals. The transmitted signals typically include pilot signals or CDMA pilot codes to enable the

rake receivers to generate estimates of the propagation channels from the mobile terminals to the base stations. The received signals output from each of the rake receivers are input to a central processor.

[0007] The central processor models the mutual interference between the received signals by combining correlation coefficients between the known spreading codes with the channel estimates produced by the rake receivers to obtain an interference matrix A. The processor uses the interference matrix A to combine the received signals such that the mutual interference between signals from different mobile terminals is substantially eliminated. The received signal from each mobile terminal is then processed to compensate for the effects of intersymbol interference, for example, by means of a Viterbi equalizer.

[0014] Turning now to the drawings, FIG. 1 illustrates an exemplary wireless communication network for practicing the present invention, generally referred to by the numeral 10. A plurality of mobile terminals 16 transmit signals to one or more of base stations 12. The base stations 12 receive the transmitted signals via antennas 14. As seen in FIG. 1, each base station 12 receives signals overlapping in time from two or more mobile terminals 16. Base stations 12 forward the received signals to a central processor 18, which as described below, processes the received signals to reduce the mutual interference between the signals from different mobile terminals 16.

[0015] For purposes of explaining the present invention, the simple example of three base stations 12 receiving signals from three mobile terminals 16 is used. In this example, each one of the mobile terminals 16 transmits a signal to each base station 12. Each mobile terminal 16 transmits the same signal to all three base stations 12; however, the signals transmitted by different mobile terminals 16 are different. The transmitted signals combine at each base station 12; but, because the transmit signals are modulated with different spreading codes, each base station 12 is able to separate the signals received from different mobile terminals 16. To separate the signal received from a given mobile terminal 16 from signals received from other mobile terminals 16, the base station 12 correlates the combined signal from all three mobile terminals 16 with the spreading code of a selected mobile terminal 16 using a rake receiver 15. The output of the rake receiver 15 is the received signal for a particular code channel. Each base station 12 typically includes a plurality of rake receivers 15 so that the base station 12 can receive signals from all three mobile terminals 16 simultaneously using a different rake receiver 15, each of which is matched to a selected code channel. Thus, if mobile terminal 16A is transmitting on code channel A, the output of the rake receiver 15 matched to that code channel, denoted as rake receiver 15A, is the received signal from mobile terminal 16A. Similarly, rake receivers 15B matched to code channel B output a received signal from mobile terminal 16B, and rake receivers 15C matched to code channel C output a received signal from mobile terminal 16C. As will be explained in more detail below, the received signals output from the rake receivers 15A, 15B, and 15C include mutual interference from caused by the transmissions from the other mobile terminals 16, as

well as intersymbol interference (ISI).

[0016] Each mobile terminal 16 transmits its respective signal through different uplink propagation channels. In this context, the term "channel" refers to the propagation path or transmission path between two or more points, and includes multipath propagation channels. The term propagation path or multipath as used herein refers to a single propagation path in a multipath channel. The term channel is also used to refer to a code channel in a CDMA system, or to a particular frequency and timeslot in a TDMA system, that is used for communication between two devices. In most instances, the appropriate meaning should be apparent from the context. However, an effort will be made to use the term "communication channel" or "code channel" when referring to a channel used for communication between two devices, as opposed to a propagation path.

[0017] The set of uplink propagation channels between each mobile terminal 16 and each transmit antenna 14 may be represented using the nomenclature C.sub.jk. This symbol denotes the channel between the jth mobile terminal 16 and the kth transmit antenna 14. Thus, in the illustration, C.sub.11 denotes the channel between mobile terminal 16A and transmit antenna 14A, C.sub.12 denotes the channel between mobile terminal 16A and transmit antenna 14B, and so on.

2. Claims 17-22 Are Patentable

Claim 17 is patentable because it recites, among other things, the subject matter indicated in bold below.

A communications method for use in a communications system including a base station and a plurality of wireless terminals, a different communications channel existing between each wireless terminal in said plurality of wireless terminals and said base station, the communications channel existing between each particular wireless terminal and the base station having a quality which is the channel quality for the particular wireless terminal, the method comprising:

operating a first wireless terminal having a first channel quality to transmit a first portion of a superimposed communications signal to said base station; and

operating a second wireless terminal having a second channel quality to transmit a second portion of said superimposed communications signal to said base station, the first and second channel qualities being different by at least a first pre-selected amount, said first and second signal portions combining in the air during transmission to the base station to form said superimposed communications signal.

In rejecting claim 17, the Examiner cites paragraphs 0014-0020 and 0054-0058 as disclosing the subject matter indicated in bold above.

Applicants' representative has reviewed the cited paragraphs and have been unable to find anything that discloses or suggest the subject matter indicated in bold. Accordingly, since the reference does not disclose the claimed subject matter it is respectfully submitted that the rejection of claims 17-22 should be withdrawn

If the Examiner intends to maintain the rejection, it is requested that the Examiner be prepared to identify precisely what in the applied Dent reference the Examiner believes corresponds to the first channel quality mentioned in the claim, the second channel quality and where a first pre-selected amount by which the first and second channel qualities differ is described.

3. Claims 23-25 Are Patentable

Claim 23 and the claims which depend therefrom are patentable because the applied reference fails to disclose:

A wireless terminal including:
a receiver for receiving a superimposed assignment signal including a first signal portion and a second signal portion one of said signal portions being intended for said wireless terminals with the other one of said signal portions being intended for another wireless terminal, the first signal portion being received with at a lower power level than said second signal portion;
a superposition decoder for decoding said first and second signal portions;
means for determining from information included in one of said first and second signal portions which portion is intended for said wireless terminal; and
a transmitter for transmitting signals in uplink communications channel segments to which received superimposed assignment signals intended for said wireless terminal correspond.

In rejecting claims 23-25 the Examiner cites various paragraphs of the Dent reference. However, Applicants' representative believes they fail to disclose the elements indicated above let alone the novel combination of elements. Accordingly, it is submitted that the rejection of the claims 23-25 should be withdrawn.

If the Examiner intends to persist in any of the rejections, it is requested that the Examiner be prepared to identify precisely in the cited portions

of the reference the Examiner contends corresponds to: a superimposed assignment signal, a first signal portion, a second signal portion and where in the reference it indicates that the first signal portion is received with at a lower power level than said second signal portion.

Also, what in the reference does the Examiner believe corresponds to the recited element:

means for determining from information included in one of said first and second signal portions which portion is intended for said wireless terminal

4. Claims 26-29 Are Patentable

A. Independent claim 26

Independent claim 26 and the claims which depend therefrom are patentable because claim 26 recites:

A communications method for use in a communications system including a base station and a plurality of wireless terminals, a different communications channel existing between each wireless terminal in said plurality of wireless terminals and said base station, the communications channel existing between each particular wireless terminal and the base station having a quality which is the communications channel quality for the particular wireless terminal, signals transmitted from the wireless terminals to the base station combining in the communications channel, the method comprising:

operating the base station to:
assign an uplink communications channel segment to be used simultaneously by a first and second device;

receive a composite signal from said uplink communications channel segment, said composite signal including a first signal transmitted by said first device and a second signal transmitted by said second device; and

perform a superposition decoding operation on the received composite signal to decode the first and second signals included in said composite signal.

Applicants believe the applied reference fails to disclose the subject matter indicated in bold above.

If the Examiner intends to maintain the rejection, it is requested that the Examiner clarify what the Examiner asserts corresponds to "an uplink communications channel segment" and where the reference describes assigning such a segment. Applicants respectfully submit that a code is not a segment. It is also requested that the Examiner identify precisely where the superposition decoding operation relating to the assigned segment is described.

B. Dependent claim 27

While dependent claim 27 is patentable for the same reasons claim 26 is patentable, is also patentable because dependent claim 27 includes the additional features of:

...operating the base station to:
select based on communications channel quality information, a first wireless terminal and a second wireless terminal, the first and second wireless terminals having different wireless terminal communications channel qualities, to share an uplink traffic segment; and

wherein the method further comprises
operating the base station to:

transmit to the selected first and
second wireless terminals information
indicating the assigned traffic channel
segment and which one of the first and
second wireless terminals should transmit
signals to be received by said base station
at a higher power level

Applicants respectfully submit that claims 27-30 are
patentable because the applied reference fails to
disclose the additional features indicated above in bold.

If the Examiner intends to maintain any of the
rejections of claims 27-30 it is requested that the
Examiner be prepared during the interview to identify
precisely where the reference describes the base station
selecting first and second wireless terminals and what in
the reference the Examiner asserts is information
indicating which one of the first and second wireless
terminals should transmit signals to be received by said
base station at a higher power level in the reference.

III. Conclusion

Applicants look forward to discussing the
invention and the pending claims with the Examiner during
the requested interview.

In view of the foregoing amendments and
remarks, the Applicants respectfully submit that the
pending claims are in condition for allowance.
Accordingly, the Applicants request that the Examiner
pass this application to issue.

If there are any outstanding issues which need to be resolved to place the application in condition for allowance the Examiner is invited to contact Applicants' undersigned representative by phone to discuss and hopefully resolve said issues. To the extent necessary, a petition for extension of time under 37 C.F.R. 1.136 is hereby made and any required fee is authorized to be charged to the deposit account of Straub & Pokotylo, deposit account number 50-1049.

None of the statements or discussion made herein or during the summarized interview are intended to be an admission that any of the applied references are prior art to the present application and Applicants preserve the right to establish that one or more of the applied references are not prior art.

Respectfully submitted,

January 19, 2007

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